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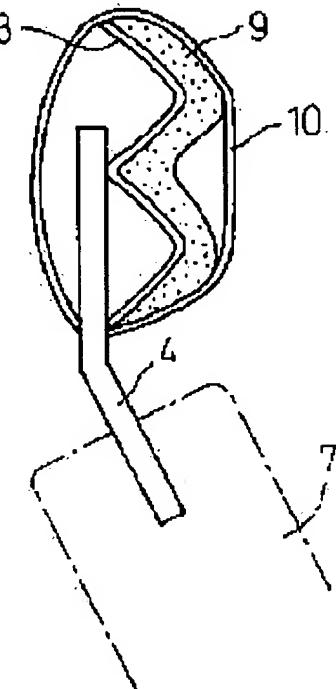
## (54) INTERIOR PART FOR VEHICLE

(57)Abstract:

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PROBLEM TO BE SOLVED: To provide interior parts for vehicles which hardly causes disposal problems.

SOLUTION: Materials constituting interior parts for vehicles are made of a biodegradable material. The interior part for vehicles is used for a headrest preferably. When the headrest is comprised of a stay fixed to an upper end of a seatback, a base material which is fixed to the front surface of the stay or to both front and back surfaces of the stay and has a configuration to exhibit energy absorbency, a cushion material fixed to the surface of the base material, and an outer cover material covering the cushion material, the base material, the cushion material, and the outer cover material are made of the biodegradable material.



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**CLAIMS**

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[Claim(s)]

[Claim 1] Interior parts for cars characterized by constituting the component with the biodegradability ingredient.

[Claim 2] The base material of the configuration which demonstrates endergonic fixed to both sides by the side of the front face of the stay fixed to seat-back upper limit, and this stay or a front face, and a rear face, the cushioning material fixed on this base material front face, and the headrest characterized by constituting this cushioning material from wrap epidermis material, and said base material, a cushioning material, and epidermis material consisting of biodegradability ingredients.

[Claim 3] The headrest according to claim 2 which can adjust reinforcement when the biodegradability ingredient which constitutes said base material changes the rate of the orientation of this biodegradability fiber including biodegradability fiber.

[Claim 4] The headrest according to claim 1 which can adjust endergonic when the biodegradability ingredient which constitutes said epidermis material changes the rate of the orientation of this biodegradability fiber including biodegradability fiber.

[Claim 5] The headrest according to claim 2 by which said cushioning material is constituted from polyvinyl alcohol.

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

[Field of the Invention] This invention relates to the interior parts for cars which consisted of biodegradability ingredients which a component disassembles into a detail in soil and the natural environment of the sea middle class about the interior parts for cars.

**[0002]**

[Description of the Prior Art] In the automobile, resinification is progressing quickly for the purpose, such as lightweight-izing for energy saving, in recent years. Especially as for the component which can be resinified in the interior parts of an automobile, most is resinified. As interior parts with which this resinified component is used, an instrument panel, a console box, a sheet, a headrest, a door trim, head lining, a floor, a combined instrument, a sun visor, etc. are mentioned.

[0003] For example, although the instrument panel consists of a base material, a cushioning material, and epidermis material fundamentally, acrylonitrile and acrylonitrile-styrene butadiene rubber, polypropylene, denaturation polyphenylene ether, etc. are used for this base material, and polyurethane foam, polyvinyl chloride form, polypropylene form, etc. are used for the cushioning material, and a polyvinyl chloride, polyethylene terephthalate, etc. are used for epidermis material.

**[0004]**

[Problem(s) to be Solved by the Invention] When motor vehicle cassation of the automobile is carried out and it is abandoned as waste, it does not decompose over a long period of time, and since these resin will generate an elevated temperature if it destroys by fire, it becomes the cause which damages an incinerator, it also serves as a generation source of harmful matter, such as the so-called dioxin, further, and serves as a big social problem.

[0005] This invention solves the abandonment problem accompanying use of the above resin, and aims at offering the interior parts for cars which can be discarded without causing an environmental problem.

**[0006]**

[Means for Solving the Problem] In order to solve the above-mentioned trouble, according to this invention, a biodegradability ingredient constitutes the component of the interior parts for cars.

[0007] Moreover, according to the 2nd invention, in the base material of the configuration which demonstrates endergonic fixed to both sides by the side of the front face of the stay fixed to seat-back upper limit, and this stay or a front face, and a rear face, the cushioning material fixed on this base material front face, and the headrest which consists of wrap epidermis material in this cushioning material, said base material, a cushioning material, and epidermis material consist of biodegradability ingredients.

[0008] Moreover, according to the 3rd invention, in the above-mentioned headrest, when the biodegradability ingredient which constitutes said base material changes the rate of the orientation of biodegradability fiber including biodegradability fiber, reinforcement is adjusted.

[0009] Moreover, according to the 4th invention, in the above-mentioned headrest, when the biodegradability ingredient which constitutes said epidermis material changes the rate of the orientation

of this biodegradability fiber including biodegradability fiber, it is adjusting endergonic.

[0010] Moreover, according to the 5th invention, in the above-mentioned headrest, said cushioning material consists of polyvinyl alcohol.

[0011]

[Embodiment of the Invention] As mentioned above, this invention is characterized by constituting the ingredient which constitutes the interior parts for cars from a biodegradability ingredient. As these interior parts, an instrument panel, a console box, a garnish (a front pillar garnish, a center pillar garnish, a roof side-rail garnish, a roof side inner garnish, rear seat garnish), a trim (a door trim, a cowl side trim, a package tray trim, a RAGGEJI side trim, a luggage rear trim, deck trim), head lining, a floor, a sheet, a headrest, sunroof glass, backdoor glass, etc. are mentioned.

[0012] According to this invention, a biodegradability ingredient constitutes the ingredient which constitutes these interior parts, i.e., panel material, board material, a cushioning material, epidermis material, transparency material, etc. As this biodegradability ingredient, various kinds of ingredients can be used according to that use part and property searched for, for example, polylactic acid, polyhydroxy butyrate, the poly caprolactone, polybutylene succinate, Pori (butylene succinate / horse mackerel peat), Pori (butylene succinate / carbonate), polyethylene succinate, polyvinyl alcohol, cellulose acetate, starch modified resin, cellulose modified resin, etc. can be used.

[0013] For example, the instrument panel consists of a base material 1, a cushioning material 2, and epidermis material 3 fundamentally, as shown in the sectional view of drawing 1. Since it is attached to a car body direct picking, high rigidity is required, and in summer, since the closed interior of a room serves as a remarkable elevated temperature, high thermal resistance is also required of a base material 1. In order to require the flexibility at the time of touching an instrument panel and to mitigate damage on crew's head at the time of the collision of a car, high impact absorptivity is also required of a cushioning material 2. Furthermore, the merit of a feel and appearance is required of the epidermis material 3, and thermal resistance and weatherability are also required of it. Then, an ingredient is chosen so that these demands may be filled, and an instrument panel is manufactured by the suitable fabricating method. When specifically manufacturing the full pad type instrument panel as [ shown in drawing 1 ], beforehand, by the injection-molding method etc., a base material is fabricated, using the glass fiber strengthening AS as resin, and film-like epidermis material is fabricated using PVC . Subsequently, this base material and epidermis material are set to the die, urethane is slushed with an impregnation machine, and close a die, it is made to really foam and is fabricated.

[0014] Drawing 2 shows the general structure of a headrest. A headrest consists of wrap epidermis material 6 in the cushioning material 5 usually fixed to the U-shaped stay 4, and this cushioning material 5, and the upper limit of a sheet 7 is inserted and equipped with stay 4. the conventional headrest -- as a cushioning material -- polyurethane -- moreover, resin, such as a polyester cloth and a vinyl chloride, is used as epidermis material. This invention constitutes this cushioning material 5 and the epidermis material 6 from a biodegradability ingredient.

[0015] Preferably, this cushioning material 6 is formed from the ingredient containing polyvinyl alcohol. Specifically, it forms from the mixture containing polyvinyl alcohol 20 - 30 weight sections, starch 20 - 30 weight sections, ethylene glycol 160 - the 200 weight sections, a boric acid 10 - 15 weight sections, and water 120 - the 180 weight sections. It is known that polyvinyl alcohol is disassembled by the specific microorganism, and since starch is naturally also decomposed by the microorganism, after discarding the cushioning material formed from this mixture to reclaimed ground etc., it will be completely decomposed by the microorganism.

[0016] In this invention, although polyvinyl alcohol forms the frame of a cushioning material and there is especially no limit as this polyvinyl alcohol, a saponification degree is more than 85 mol %, and that whose molecular weight is 500 is desirable. Moreover, although this polyvinyl alcohol saponified polyvinyl acetate, it may be a copolymer saponification object with others, vinyl acetate, other copolymerizable monomers, for example, ethylene, a vinyl chloride, vinyl ether, acrylonitrile, acrylamide, etc.

[0017] Starch and ethylene glycol bar bridge formation (hydrogen bond) with polyvinyl alcohol and a

boric acid, and adjust the cushioning properties of a cushioning material. Therefore, the cushioning properties of the cushioning material obtained can be set as arbitration by changing the loadings of starch and ethylene glycol. The raw starch obtained from various vegetation, for example, corn, a potato, rice, legumes, wheat, etc. as this starch and the modified starch which reformed this raw starch, for example, physical denaturation starch, enzyme denaturation starch, chemical decomposition denaturation starch, chemistry denaturation starch, etherification starch, etc. can be used.

[0018] A boric acid functions as a cross linking agent, and makes polyvinyl alcohol construct a bridge by hydrogen bond. Moreover, the cushioning material which this boric acid functions also as a flame retarder, therefore is obtained has high fire retardancy.

[0019] The epidermis material 6 is formed from the textiles or the sheet of fiber formed from the above-mentioned biodegradability ingredient. Preferably, this epidermis material 6 consists of textiles of the fiber of a biodegradability ingredient.

[0020] Drawing 3 shows the desirable mode of the headrest of this invention. This headrest consists of wrap epidermis material 10 in stay 4, the base material 8 fixed to the front face of this stay 4, the cushioning material 9 fixed on this base material front face, and this cushioning material 9.

[0021] This base material 8 serves as a "character of \*\*"-like configuration of demonstrating endergonic as shown in drawing 3, or a wave type configuration, and shows cushioning properties. In addition, although it is the shape of a character of \*\* to the perpendicular direction of a headrest in drawing 3, you may be the shape of a character of this \*\* to the horizontal direction of a headrest. This base material 8 consists of above-mentioned biodegradability ingredients, and consists of biodegradability resin fiber and a natural fiber preferably. As a natural fiber, hemp (flax, a ramie, Manila hemp, a henequen, a kenaf, jute), cotton, etc. can be used, for example. As for the blending ratio of coal of biodegradability resin fiber and a natural fiber, it is desirable that it is 6:4 in a mass ratio. By the headrest shown in drawing 3, if an impact is added, a base material will absorb the energy of elongation and an impact perpendicularly. Therefore, as for this base material, it is desirable to raise the reinforcement to the perpendicular direction which is the direction of elongation, and for this reason, it can make in agreement the direction of elongation of a base material, and the orientation of fiber, and can raise the reinforcement of this perpendicular direction by raising the ratio of the natural fiber in the fiber which carries out orientation to the direction of elongation, i.e., a perpendicular direction.

Moreover, it can adjust endergonic [ endergonic / of a base material ], i.e., cushioning properties, to arbitration by changing the rate of the orientation of fiber in this way. Since a base material is horizontally extended when the base material serves as a character of \*\* to the horizontal direction of a headrest, a natural fiber can be arranged horizontally, and the reinforcement which receives horizontally can be raised, and cushioning properties can be adjusted.

[0022] As for a cushioning material 9, it is more desirable to constitute from same ingredient as the cushioning material 5 of the headrest shown in drawing 2, and to constitute from mixture of the above-mentioned polyvinyl alcohol, starch, ethylene glycol, and a boric acid. In the headrest of drawing 3, since a base material 8 has cushioning properties, as compared with the case of the headrest of drawing 2, a cushioning material 9 is a film and can demonstrate equivalent cushioning properties.

[0023] The epidermis material 10 also consists of same biodegradability ingredients as the headrest shown in drawing 2. carrying out orientation of the fiber which constitutes the epidermis material 10 in the same direction as the direction of elongation of epidermis material, since this epidermis material 10 will also be perpendicularly extended if an impact joins a headrest -- or the reinforcement to the direction of elongation can be raised by making a natural fiber mix perpendicularly in part at least.

[0024] In drawing 3, space other than a base material 8 and cushioning material 9 may be filled up with the ingredient which may be hollow or was excellent in permeability, for example, the low consistency felt etc., in the space surrounded by the epidermis material 10.

[0025] Drawing 4 shows other modes of the headrest of this invention. This headrest has formed the base material 8 and the cushioning material 9 not only in the front-face side of stay but in the rear-face side, and can ease the impact to the crew of a backseat who can set at the time of the collision of a car. The component and configuration of the base material by the side of this rear face and a cushioning

material may be the same as that of the base material and cushioning material which are shown in drawing 3.

[0026] As mentioned above, since the headrest shown in drawing 2 - 4 consists of components of a biodegradability ingredient, it can avoid the problem accompanying abandonment of synthetic resin. Furthermore, by the headrest shown in drawing 3 and 4, by changing into the configuration list of a base material the rate of the orientation of the fiber which constitutes a base material and epidermis material, cushioning properties can be adjusted to arbitration, cushioning properties equivalent to the former can be demonstrated also by the layer of a cushioning material thinner than before, and the whole can be lightweight-sized, and the amount of trash can be reduced.

[0027]

[Example] Manufacture polyvinyl alcohol (Nakarai Tesuku polyvinyl alcohol, degree of polymerization 500) 25g of a cushioning material, starch (Nakarai Tesuku soluble starch) 25g, and 150g of water were stirred at 80 degrees C, and Mixture A was obtained. On the other hand, 12.5g [ of boric acids ] and ethylene glycol 180g and 100g of water were stirred at 80 degrees C, and Mixture B was obtained. This mixture A and B was stirred in 80 degrees C, and it mixed. This mixture was slushed into the mold and the cushioning material was obtained by cooling.

[0028] Like the above, the amount of ethylene glycol and the amount of starch were changed, as shown in the following table 1, and manufacture of a cushioning material was tried.

[0029]

[Table 1]

サンプルNo	1	2	3	4	5
エチレングリコール量	75g	75g	180g	180g	400g
デンブン量	0g	25g	0g	25g	25g
混合時の粘度	混合時固化	混合時固化	○	○	○
冷却時の収縮	—	—	大	小	固化せず
判定	×	×	×	○	×

[0030] In this mixture for cushioning material manufacture, when there were many amounts of ethylene glycol (sample 5), Mixture A and B was mixed, and even if it slushed into the mold and cooled, it did not solidify. On the other hand, when there were few amounts of ethylene glycol (samples 1 and 2) and Mixture A and B was mixed, since the viscosity of this mixture was high, it was not able to slush into the mold well. This is considered because the rate that polyvinyl alcohol and a boric acid construct a bridge is large when there are few amounts of ethylene glycol. Thus, the amount of ethylene glycol affects the viscosity of mixture and affects the moldability of a cushioning material.

[0031] Moreover, about the existence of the starch in the mixture for cushioning material manufacture, when starch was included (sample 4), contraction of the Plastic solid at the time of cooling was small. Starch serves as steric hindrance and this is considered to be for barring bridge formation of polyvinyl alcohol and a boric acid. On the other hand, when starch is not included (sample 3), a Plastic solid will contract greatly at the time of cooling, and a big cavity will be generated. This is considered to be for bridge formation of polyvinyl alcohol and a boric acid to advance and contract at the time of cooling. Thus, starch affects whenever [ contraction / of the Plastic solid at the time of cooling ].

[0032] The impact-absorbing property was measured about the urethane cushioning material (100mmx100mmx5mm) used as a cushioning material the cushioning material (sample 4,100mmx100mmx5mm) of the physical-properties measurement above, and conventionally. Using the impact-absorbing property measuring device as shown in drawing 5 , the weight 12 formed at the tip of a pendulum at the cushioning material sample 11 was made to collide, and the generating G when colliding was measured with the G sensor 13, the amplifier 14 for G sensors, and an oscilloscope 15. In addition, as a G sensor, the BURYUERU care acceleration pickup 4371 was used as amplifier for G

sensors, and the YOKOGAWA 8ch digital oscillograph DL 708 was used as the Ono Sokki charge amp CH1100 and an oscilloscope. The generating G when not arranging a sample was 750G, the generating G about the sample 4 of this invention was 19G, and the generating G about an urethane sample was 365G. In the case of the urethane sample, weight carried out bottoming and big G occurred. Thus, the cushioning material of this invention showed the big impact-absorbing property.

[0033] Next, in addition to the above-mentioned sample 4, based on the approach of JIS K 6400, an impact resilience multiplier, 25% hardness, and 50% hardness were measured about the urethane cushioning material in the sample (sample 6) which raised the ethylene glycol content 10% and the sample (sample 7) raised 20%, and the list. This result is shown in the following table 2.

[0034]

[Table 2]

	反発弾性係数	25%硬さ (kgf)	50%硬さ (kgf)
サンプル4	26.3	2.42	18.35
サンプル6	28.3	4.48	34.03
サンプル7	36.3	—	—
ウレタンA	21.0	4.54	6.35
ウレタンB	37.0	3.06	5.61

[0035] From the result shown in the above-mentioned table 2, the cushioning material of this invention can change an impact resilience multiplier into arbitration by changing the content of ethylene glycol. 25% hardness can be made an urethane cushioning material and an EQC, and 50% hardness is large compared with urethane material, therefore it is possible to make thickness of a cushion layer thin.

[0036]

[Effect of the Invention] Since the interior parts for cars of this invention constitute the component from a biodegradability ingredient, they can avoid the problem accompanying abandonment of the conventional interior parts for cars constituted from synthetic resin. Furthermore, the cushioning material used in this invention is excellent in impact absorptivity, and even if it is thinner than the conventional cushioning material, it can demonstrate required cushioning properties.

[Translation done.]